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A STUDY OF THE AIR FORCE'S
IMPLEMENTATION OF DOD
SOFTWARE DATA RIGHTS POLICY
FOR REUSABLE SOFTWARE

THESIS

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AFIT/GCM/LSL/88S-10

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A STUDY OF THE AIR FORCE'S IMPLEMENTATION OF DOD SOFTWARE

DATA RIGHTS POLICY FOR REUSABLE SOFTWARE

THESIS

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<div align="right">Anthony L. Steadman</div>

Table of Contents

AFIT/GCM/LSL/88S-10

Abstract

The purpose of this study was to examine the adequacy of Air Force acquisition policies and procedures for software with particular emphasis on derivative works as it applies to reusable software. The study had two primary objectives: 1) Determine what relevant legal cases have been litigated which address the issue of Government software data rights and the impact of these cases on Government rights to data developed by a contractor; and 2) Determine what procedures, if any, are used by System Program Office (SPO) personnel to ensure software contracted for was not previously developed under a prior Government contract.

The methods for accomplishing the objectives included manual and automated legal research techniques as well as interviews with SPO personnel.

The study found that while commercial vendors were frequently litigating over software copyright infringement, very few disputes existed in the legal system between the Government and contractors over the issue of software data rights. This finding was interesting in light of the frequent updates that have been made to the DOD software data rights policy over the last two years.

Analysis of interviews conducted with SPO personnel found that almost all disagreements between the Government and contractor personnel over software data rights have been resolved through discussions between the two parties.

While some software is being proposed for reuse on current projects, most of the software that is being reused comes from a prior development phase or closely related contractual effort. Apparently, no additional procedures are being employed to locate reusable software. The software that is being developed is still being primarily acquired with unlimited rights.

A STUDY OF THE AIR FORCE'S IMPLEMENTATION OF DOD SOFTWARE
DATA RIGHTS POLICY FOR REUSABLE SOFTWARE

I. The Research Problem

Introduction

While many computer hardware costs declined over the
years as micro-technology and automation matured, Air Force
software life cycle costs have steadily increased. This
increase is due in part to: 1) proliferation of many
computer languages; 2) size and complexity of computer
programs; 3) shortage of experienced computer scientists;
and 4) inability to reuse previously developed software.
"The software industry has grown tremendously during this
decade. It is estimated that by the end of 1984 that the
software industry will grow by roughly 300 percent from 1981
level" (4:7). Since 1984, the software industry has seen
further dynamic expansion.

The Air Force, as well as all other agencies in DOD,
has been under intense scrutiny from Congress and the media
on how it spends taxpayers' money. In an effort to reduce
software life cycle costs and maximize return on tax
dollars, the Air Force invested in the development of new
software technology beginning in the late 1970's. This
development will continue to evolve for the next few years.
The extent to which the benefits resulting from the

1

investment in this new software technology is realized is of particular interest.

In the commercial sector, investments in software can be legally protected by either trade secret, patent, or copyright law and procedures. The DOD protects its rights in software it purchases or develops by including certain data rights clauses in its contracts. This study addresses the adequacy of Air Force acquisition policies and procedures for software with particular emphasis on derivative works as it applies to reusable software.

Background

> In 1974 a report estimating the future costs of DOD software development was produced; the projected cost of over $3 billion annually was considered horrendous. In addition, studies also showed that there were hundreds of languages and/or their dialects being used by the Defense Department and its contractors, which obviously made it difficult to interchange programs or programmers and made it harder for DOD to maintain software [17:723].

Ada, the new DOD standard programming language, is an example of new software technology that the Air Force is using in an effort to control software life cycle costs. Ada can be used to write modular programs and isolate machine dependencies, which results in the ability to reuse those modules in other programs on other computers with minimal modifications. The Air Force expects these and many other features of the Ada language to result in a reduction of development, maintenance, and training costs.

2

While more time may be spent in the software design phase when using Ada, overall development costs can be reduced as a result of improved unit test and integration of the software modules. One of the primary savings in development costs may result from the use of pre-existing software modules. These modules may only need to be sligtly modified and/or recompiled to perform a required function in the overall program. Reduced maintenance costs are also expected as program flow should be easier to follow and the rippling effect of changes minimized. Finally, training costs should also be reduced since programmers will have to learn only one programming language. That language, Ada, should compile similarly from one machine to the next since the DOD requires validation of all Ada compilers.

The goals of cost reduction and improved maintainability and reliability are admirable, but it is not clear whether the Air Force has adequate methods for monitoring and controlling software development such that these goals are realized. The use of contractual data rights clauses is one method. The Air Force protects its investment to some degree by obtaining data rights to software it has developed commensurate with its intended use.

By use of various clauses in the DOD Federal Acquisition Regulation Supplement (DFARS), the Government can acquire either unlimited or restricted rights to

3

developed software. These clauses are necessary to ensure
contractors do not prevent the Government from using the
software to the extent required by the forseeable mission.
However, conflicts of interest may arise since contractors
may also acquire certain rights to use the software for
other purposes such as commercial resale. Questions of data
rights ownership are blurred when the contractor develops
part of the software at private expense or includes
proprietary software from another contractor. In addition,
Government developed software often ends up in the public
domain. Many of these issues will be touched on in this
study. However, the main focus will be how the Government,
in light of reusable software technology, ensures that it
does not pay more than once for software developed under
previous Government contracts and re-sold back in whole or
in part by the same or a different contractor. Furthermore,
should control over the use of Government funded previously
developed software even be a concern or is there a higher
purpose served by allowing it to be reused?

Problem Statement

The Air Force has invested heavily to develop new
software technology in order to bring down software life
cycle costs. The realization of this goal could be delayed
if appropriate software data rights are not contractually
implemented and controlled. This study will investigate how

the DOD can better protect its data rights to reusable software.

Research Objectives

1. Determine if an adequate data base (e.g., Acquisition Management Information System (AMIS)) exists and is accessible for research.

2. Determine what relevant legal cases have been litig;ted which address the issue of Government software data rights and the impact of these cases on Government rights to data developed by a contractor.

3. Determine what procedures, if any, are used by lawyers, Procuring Contracting Officers (PCO), and/or Program Managers (PM) to ensure software contracted for was not previously developed under a prior Government contract (e.g., certification from contractor; data base search).

4. Determine what mechanisms should be added or modified to better ensure appropriate software data rights clauses are used and controlled in Government contracts.

Scope and Limitations of Research

The extent to which DFARS software data rights clauses and their implementation and control in Air Force contracts contributes to the realization of reduced life cycle costs will not be addressed. Such research would require quantitative cost data covering the entire software life cycle. This data may not be available until Ada has been in

the operational field for a few more years. It may be an appropriate topic for future investigation and research.

Additionally, contracts which call for the use of Ada as a Program Design Language (PDL) will not be included. While it is true that Ada PDL can be compiled and treated as code, this fuzzy distinction may cloud already perplexing legal issues under investigation. Therefore, the scope of contracts addressed in this study will be those which require software to be delivered in the Ada language.

Finally, technical data rights will be discussed and differentiated from software data rights. However, the main focus of this study will be the data rights associated with Government developed software. Associated with technical data is its own set of legal cases and Government contract clauses. A separate investigation into the state of the law regarding technical data may be warranted, but will not be included in this study.

II. Literature Search and Review

Introduction

Justification of the Search and Review. It is
necessary to determine whether current DOD policy and the
most recent legal decisions and statutes are adequate to
address the issues of data rights associated with reusable
software. The specific question relevant to this literature
search is what data rights the Government should seek in
order to maximize return on tax-payer investment while
providing incentives to contractors to develop and share
reusable software.

Scope of the Research Topic and of the Data Base. Ada
was developed in the early 1980's and is slowly becoming
available in commercial software and just recently is being
deployed in operational military systems. Thus, disputes
over the data rights to Ada code will likely be appearing in
the judicial system for adjudication. Given the newness of
the topic of interest, literature was sought which related
to patents, copyrights, and trade secrets. The concepts
contained in these articles can then be applied by analogy
to modern software concerns. While research by analogy may
not be the typical scientific method, it is a commonly
accepted practice in the field of law with which this study
primarily addresses. The literature review stopped short of
legal research which will be conducted as part of Phase II

of the research Methodology. The following resources were used to locate available literature on the topic 1) ACM Guide to Computing Literature; 2) Reader's Guide to Periodical Literature; 3) Air University Library Index to Military Periodicals; 4) AFIT/LS Thesis Index; 5) Business Periodical Index; 6) Defense Technical Information Center (DTIC); and 7) Dialogue Information Retrieval Service.

Method of Treatment and Organization. A manual search was conducted from the resources listed above in order to examine four main questions. First, what is software from a legal point of view and who has rights to it? Second, what legal protection is available for software? Third, should someone have the legal right to enhance existing software to advance the state-of-the-art? Finally, what incentives should be employed by the Government to maximize its investment in software and at the same time stimulate the growth of the software industry?

Discussion of the Literature

Software Rights. Not everyone agrees on what software is and how it should be legally treated. Is it the sole property of the creator? Can it be legally considered an invention and thus entitled to patent protection? Is it merely an idea which cannot be protected by a patent or an expression of an idea which may be protectable by copyright?

8

Ada complicates the issue even more since pieces of other

persons' work can be reused to create different programs.

> It may be hard to establish who an author is, or
> what percentage of the product he or she may rightly
> claim, when many people contribute simultaneously to a
> database or other computerized product [12:572].

When software is developed for the Government, what

rights should the Government have versus rights of the

contractor? Prior to May 1987, the DOD Federal Acquisition

Regulation Supplement (DFARS) specified that the Government

should acquire either unlimited or restricted data rights

while the contractor may be allowed to retain the right to

commercially exploit the software as they see fit (6:52.227-

7013). However, should the contractor attempt to sell the

same or slightly modified software back to the Government

under a different contract, one must ask if charging for

this software is proper. At the very least, one may

conclude that the Government is not receiving maximum return

on its investment. At the same time, contractors would

argue that unwarranted restrictions on the use of previously

developed software would inhibit industry growth.

Furthermore, what incentives would a contractor have in

reusing software?

In May 1987, DFARS 52.227-7013 was updated to consider

whether technical data and software were developed: 1)

solely at Government expense; 2) with a mix of Goverment and

contractor funds; 3) solely at contractor expense; or 4) if

contractor funded, whether or not the software was
commercialized. Furthermore, new interim policy by the DOD
was released in April 1988 (7:53-63) and the Defense
Acquisition Regulatory (DAR) council is considering still
further revisions based on a study conducted by the Software
Engineering Institute (5).

It is important, at this point, to point out that there
is a difference between technical data and computer
software.

> DOD policy regarding technical data and computer
> software has two main distinctions not necessarily
> found in...or used in commercial practice in industry.
> One is the difference between technical data (human
> readable) and computer software (machine readable). In
> order to receive treatment as technical data under the
> "Rights in Technical Data and Computer Software"
> clause, computer software documentation must be in
> human readable form. The other is the link between
> contract clauses defining rights and requirements for
> delivery. The DOD only acquires rights to data that
> are delivered or are deliverable under any future
> government contract [14:12].

While the DFARS has been updated to more adequately
address rights in technical data, it is not clear that
software data rights are addressed adequately enough by the
new regulations. In a 1986 study regarding software
acquisition policy, conducted by the Software Engineering
Institute (SEI), it was stated that:

> The question is whether software has yet been
> adequately differentiated from technical data and
> differentiated in the right ways. Has software as a
> technology been adequately understood by DOD and have
> the legal rules and practices developed by DOD to
> acquire and maintain this technology been molded to

conform to an appropriate understanding of the technology [18:3]?

Some of the ambiguities identified in the SEI study may have been sufficiently clarified in the May 1987 and April 1988 updates to the DFARS. For example, DFARS 52.227-7013(a)(17)(iv) addresses the flow-down of restricted rights to derivative software. In 1986, when the SEI study was done, it was unclear what rights the parties had in derivative software. Nevertheless, while the regulations have been updated, it is not clear that all problems have been resolved regarding software data rights. For example, DFARS 52.227-7020(b) still states that:

> All works first produced in the performance of this contract shall be the sole property of the Government, which shall be considered the 'person for whom the work was prepared' for the purpose of authorship in any copyrightable work under 17 U.S.C. 201(b), and the Government shall own all of the rights comprised in the copyright [7:10794].

However, according to the Copyright Act, 17 U.S.C. 105, the Government may not directly obtain a copyright. Perhaps the potential legal conflict is resolved by DFARS 52.227-7013(e) which states that:

> ...the Contractor hereby grants to the Government a nonexclusive, paid-up license throughout the world, of the scope set forth below, under any copyright owned by the Contractor, in any work of authorship prepared for or acquired by the Government under this contract, to reproduce the work...[7:10791].

It may be wise for Contracting Officers to require the assignment of a copyright interest to the Government by the contractor and possibly avoid a future dispute (18:10).

The Government is not alone in trying to determine rights to software. Universities are struggling with the issue of rights to software developed by its faculty and students.

> Universities are starting to review their 'intellectual-property' policies, covering everything from copyrighted textbooks to patented inventions, to see where computer software fits in [15:188].

In addition, software vendors are fighting among themselves on this question of rights to software. In Apple Computer, Inc. v. Franklin Computer Corp., the Third Circuit U.S. Court of Appeals addressed three important issues relating to software copyrights: "...whether copyrights are valid for computer programs expressed 1) in object code, 2) on a read-only memory (ROM) chip, or 3) in an operating system" (13:85). The court held copyrights are valid for all three. In contrast, some believe copyrights are obsolete in this electonic age:

> In general, the courts have tended to err on the side of the authors...giving more protection to software than may be desirable. This could discourage legitimate forms of reverse engineering. It could lead also to the duplication of effort and the enforced use of inefficient programs [12:572].

Legal Protection. Twenty years ago, long before re-usable software was an issue, a thesis was written which addressed:

> ...the foundations of the protection of original ideas...and the taking and use of these ideas by the United States Government with its correlative

12

compensation as it relates to the procurement function [23:7].

The thesis revealed that patents, copyrights, and trade secrets were the most frequent forms of protection for ideas encountered in Government contracting. "Trademarks and common law copyrights...have not been included because of the relatively minor positions which they hold as an area of difficulty in government procurement" (23:6-7). The summary and conclusions of the thesis seem consistent with the following quote written twenty years later:

> ...the requirements for a patent--considerable amounts of money, a long waiting period (usually a year or more), and full public disclosure--make it an unattractive alternative, except in rare cases. Trade secrets can be useful for the larger, more expensive software packages licensed under individual contracts. Copyright is "...the most practical means of protecting software... [13:84].

While the above thesis reflects somewhat outdated laws and regulations, there appears to be a concensus, even today, for using software copyrights. However, some still feel copyright laws are not adequate. New copyright laws were enacted in 1976 and 1980, but the Office of Technology Assessment in a recent report commented

> The patent and copyright laws must be overhauled to take account of complex new electronics and communications gadgetry [12:572].

While the General Services Administration (GSA) administers the Federal Software Exchange Center (FSEC):

> The FSEC holds software that is quite limited in type. For the most part the holdings of this center are limited to software for a specific system, and not

13

applicable to the many different types of computers in use in the Government [4:31].

State-of-the-Art Advancement. One of the main reasons software technology is advancing so rapidly is its evolutionary nature. A software package can be enhanced incremently. For example: a company's software allows basic text formating; graphics; color; multi-windowing; mouse; and many other capabilities. This company may not have invented all these concepts; it may have developed some and combined them with others in new and unique ways. Other developers in turn can enhance this approach to produce even more advanced software. However, most companies, perhaps rightly so, wish to be compensated for the use of their ideas by others. Apple, for example, has received settlements from companies attempting to use Macintosh-like products including such companies as Franklin Computer Corp. and Digital Research Inc. (25:6).

If a strict proprietary attitude is adopted in the Ada community, it could be devastating. The DOD justified spending the money to develop Ada technology by pointing to reduced life cycle and future development costs. If the code is not shared, these reductions may never come to pass. "These actions will stifle the incremental evolution that is at the root of any significant growth in our industry" (25:6). There has to be a balance between return on

14

investment and advancement of state-of-the-art by sharing of code.

Incentives for Both Government and Contractor. The Government faces a similar dilemma as do companies, such as Apple, when it pays for the development of new software. It seems fair that the Government be compensated by vendors who use Government software to develop new products. This compensation could be in the form of free use of modified software; or a discount on the price; or reduction in future development costs. Since Ada code is reusable,

> Contractors who compete in the early phases of developing hardware or software should be required to identify known components for which proprietary right will be asserted in the depicting data [9:17].

Perhaps the Government could establish incentive structures to pay contractors for reusing code. This would certainly be less expensive than paying re-development costs. A good example of how such an arrangement might work is found in an experimental Federal technology transfer policy.

> The statute [Federal Technology Transfer Act of 1986] encourages industry to make better use of Federal research by providing new incentives: for the first time all 700-odd Federal laboratories will be able to enter into collaborative research agreements with private industry and to grant companies exclusive development rights [22:62].

Some balance must be reached because unlimited rights may be more than the Government needs and may drive costs up unnecessarily. At the same time, rights that are too

15

limited may result in higher acquisition and development costs by the Government in the future.

Conclusion

While patents and copyrights affect other areas of intellectual property, this discussion was limited to software. Industry, academia, and Government are all struggling to define and protect data rights to this software. The courts and Congress may ultimately decide this issue, but for the time being it appears only limited legal guidance is available. This limited guidance will be expanded as more cases are litigated and decided.

Copyrights have been legally upheld for object code, ROM chips, and operating systems. Copyrighting appears to be the most widely used method for legally protecting the use of programs. However, given the advanced state-of-the-art in software technology, new creative methods of protection should be examined.

It does not appear desireable that industry or the Government be allowed to be so protective of developed code as to impede the advancement of the technology. Industry appears to be more zealous than ever in preventing others from using its ideas. Its motivation is prevention of lost profits, but its actions may have just the opposite effect. The Government, on the other hand, went from one extreme to the other. At first, n, one was granted patents or

16

copyrights on Government developed projects. Now, patents
and copyrights are granted with the Government reserving the
right of royalty free usage, but no structure exists to
ensure the Government is not charged later for something it
paid to initially develop.

New incentives are needed to motivate industry to
develop and report reusable software. The Federal
Technology Transfer Act of 1986 and the April 1988 changes
to the DFARS are good starts, but further changes to the
Defense Federal Acquisition Regulations may be needed to
ensure wide-spread reuse of software developed for DOD.

III. Methodology

Introduction

The research will be conducted in three distinct
phases. The first phase will involve locating necessary
sources and points of contact which will lead to primary
research data. In the second phase, legal research will be
conducted to determine what Government software data rights
issues are being litigated. Finally, telephone and personal
interviews will be conducted with lawyers, Procuring
Contracting Officers (PCOs), and Program Managers (PMs).
Each phase is described in detail below.

Phase I - Data Availability Determination

In order to accomplish research objective one, it must
be determined where the required contract information is
located and how it can be obtained. Informal interview
questions will be developed. These questions will focus the
interviews ensuring necessary information is collected and
interviewee time is minimized.

Telephone and personal interviews with key personnel in
the Ada Joint Program Office (AJPO) and Air Force
contracting centers will be conducted. These interviews
should lead to a sampling of Air Force Program Offices
having contracts containing software data rights clauses
regarding Ada computer programs.

18

Phase II - Legal Research

Legal research will be conducted for case law dealing with litigation of Government software data rights. Each case used will be Sheppardized (an updating method) to find the most recent legal decisions. Phase II should satisfy research objective two.

Phase III - Collect Interview Data

The names, phone numbers, and addresses obtained in Phase I above will be used to contact Program Offices.

Step 1 - Develop Interview Format. Interview questions will be developed. These questions will focus the interviews ensuring necessary information is collected and interviewee time is minimized.

Step 2 - Conduct Interviews. Telephone and personal interviews will be conducted with lawyers, PCOs, and PMs to determine what procedures, if any, are used to ensure that software contracted for was not previously developed for the Government. The data collected should satisfy this third research objective.

Closing Discussion

The only unusual aspect of the methodology may be that research objective four (mechanisms needed to ensure use of appropriate clauses) requires no additional research. The information obtained from Phases II and III in addition to

the literature review may reveal modern techniques for protecting software data rights which may be appropriate for Air Force use.

It is anticipated that Phase I will be the biggest hurdle. The extensiveness and accuracy of that information will effect Phase III above. However, the most time consuming individual task may be Phase II which can be done in parallel to Phases I, III.

IV. Findings

Introduction

This chapter presents the results of the three phases of the research project described in Chapter III. The first phase involved a data availability check. This check determined if a list of program offices and points of contact needed to accomplish the interviews in Phase III was accessible. The results of the legal research in the second phase helped shape the structure of the interviews in Phase III.

Phase I - Data Availability Determination

The questions that needed to be asked were straight-forward and brief. The objective was to locate Air Force programs that are contracting for Ada as a software development language. It was not necessary to structure questions in such a way that statistical analysis could be performed.

The search began by calling the Wright-Patterson Air Force Base (WPAFB), Ohio, base information (AV785-1110) to locate a phone number for the Aeronautical Systems Division (ASD) Language Control Facility (LCF) which is associated with validation of Ada compilers for the Department of Defense (DOD) (AV785-4472). The following questions were asked of the LCF:

1. Are you aware of a listing which tracks which
Air Force System Program Offices (SPOs) are using
Ada as a software development language?

2. If yes to 1 above:
    a. do you have such a list?
    b. how current is the list?
    c. can a copy be made available?
    d. who is responsible for
    maintaining/updating the list?

3. If no to one of the questions above:
    a. do you know who might have such a list?
    b. do you know of any Air Force programs
    that are using Ada as a development language?

The LCF kept no such list, but recommended Mr. Nelson

Estis be contacted at the X-SPO (AV785-5945) since the X-SPO

is contracting for an Ada compiler to accomodate the MIL-

STD-1750 computer architecture. The trail ended at the Ada

Joint Program Office (AJPO) with information provided by Mr.

Fred Yu (AV224-0212). Mr. Yu forwarded a list of DOD

programs that were either actually using or planning to use

Ada as a development language or program design language

(PDL).

Additional information was obtained from the WPAFB

newspaper, The Skywriter, dated 20 November 1987, which

published an article on Aeronautical Systems Division (ASD)

SPOs dealing with Ada development. The base telephone

operator was contacted again and numbers were obtained for

the four SPOs listed in the article.

From these sources it was determined that an adequate

list of programs using Ada as a development language could

be located and Phase III accomplished. It was decided that

the list of programs and points of contact should not be disclosed in order to facilitate open and honest responses to interview questions.

It was also determined that the Acquisition Management Information System (AMIS) could not be used to locate additional SPOs that were specifically using Ada as a development language. The AMIS data base can not be searched and sorted to that level of detail.

Phase II - Legal Research

Research on software and copyright case law was broken into functional elements and order of precedence. For example, cases on protests by disappointed bidders or contract disputes between the DOD and contractors will be found in decisions by the Comptroller General, Claims Court (formerly Court of Claims), or Armed Services Board of Contract Appeals (ASBCA). Moreover, persuasive case law may be found between commercial parties as well. Thus, federal cases were Sheppardized (to find the latest case law) and relevant holdings reviewed.

Government Case Law. Several approaches were used to locate protests and disputes relating to Government contracting for software and associated data rights. The available manual research library did not carry West reports (legal research publication) for Armed Services Board of Contract Appeals (ASBCA) or Comptroller General decisions.

23

Research publication, Commerce Clearing House, Inc., was referenced for the manual search of these judicial bodies. West Reporters, another legal research publication, were available to research cases in the U.S. Claims Court. Thus, the search began with a review of U.S. Claims Court decisions. Computerized data base searches were subsequently conducted to supplement and confirm findings from the manual search.

First, a manual search was conducted utilizing West's key number, cross reference, and Sheppardized resource material. The 'Statutes and Rules' Index yielded no cases which referenced 17 United States Code Anotated (USCA) (Copyright Act) or 10 USCA 2320 (Rights in Technical Data). Likewise, the 'Cumulative Words and Phrases' Index had no relevant listings. Finally, each article under 'Judicial Highlights' was scanned and still nothing was found on software data rights.

Second, manual research efforts turned to ASBCA and Comptroller General decisions using the Commerce Clearing House, Inc., Government Contract Reporter reference material. The indexing system did not directly list software, instead broad contract terminology was used. Furthermore, no Sheppard-like referencing system could be located. This approach proved awkward to the researcher and yielded no cases on software before the ASBCA, Claims Court, or Comptroller General.

Third, automated data base searches were used to confirm manual research findings. Federal Legal Information Through Electronics (FLITE) is a Government data base service out of Denver, Colorado. The zip code is 80279. Telephone numbers which can be used are autovon AV926-7531 or commercial (303) 370-7531. Mr. Dick Kolkoski was contacted at FLITE and asked to perform a data base search based on relevant key words (e.g., copyright; software; etc.) The FLITE report was based on a search of ASBCA cases from November 1970 to October 1986. This report contained only five cases which mentioned software in the text of the decision. Of these five, only three are even remotely on point with respect to software data rights, but the issues they raised will be discussed in Chapter V, Analysis and Discussion.

Westlaw is another legal computerized data base research capability offered by West Publishing Company. A data base search of Westlaw by a fellow Air Force Institute of Technology (AFIT) student, researching the history of software data rights, revealed no additional cases on point. Thus, it was determined that the manual research methods were fairly accurate in showing that there were very few Government cases existing on the subject.

Commercial Sector Case Law. A manual search was conducted utilizing West's key number, cross reference, and Sheppardized resource material. The manual search yielded

sufficient case law which resulted in a determination that a supplemental computerized search was unnecessary.

First, a search was conducted for descriptive words (e.g., copyright; software; derivative works; etc.) in West's General Digest, 7th Series, Vol. 10, 1987, and 6th Series, Vol. 53, 1986. Both yielded limited results with a statute and two relevant cases referenced.

Second, a look in West's Federal Practice Digest 3d, Vol. 21, 1984, yielded several relevant cases under the topic of copyright. These cases were synopsized in the digest and the ones most on point were picked out for further analysis.

Third, those cases identified in the second step above were Sheppardized to determine: 1) whether they had been overturned; and 2) what later cases referenced them as precedence. No case was found to be directly overturned subsequent to its initial holding.

Fourth, approximately one-hundred Sheppard's references were scanned and pertinent cases identified for further analysis.

Fifth, a detailed evaluation was conducted of those cases to determine which were most on point from steps one through four above. Those evaluations revealed additional cases referenced in the text of the case. The referenced cases were read for possible inclusion in the final analysis section.

26

The manual search for commercial cases dealing with software data rights was narrowed to a select number of cases which will be discussed in Chapter V, Analysis and Discussion. While many cases on software data rights were found, the cases presented are most on point and representative of issues relevant to reusable software and derivative works.

Phase III - Collect Interview Data

Step 1 - Develop Interview Format. The purpose of the interview was to determine what procedures, if any, are used by System Program Office (SPO) personnel to assess whether software delivered by the contractor to the Government is originally developed by him or a result of derivative works. In addition, since so few cases were found during the Phase II, Legal Research, the interviews were used to determine if disputes between Government and contractor personnel arising over software data rights were mainly being resolved at the SPO level. Furthermore, if disputes have arisen, how are they being resolved? The interview format is contained in Appendix A.

Step 2 - Conduct Interviews.

Interviews were conducted with personnel from various program offices representing three U.S. Air Force product divisions, Electronic Systems Division (ESD), Aeronautical Systems Division (ASD), and Armament Division (AD). The

results of the interviews are summarized below with detailed analysis and discussion contained in Chapter V.

In order to verify that the questions were being directed toward the proper personnel, interviewees were asked in Question 1 to state their position and, in Question 2a, whether or not their program used Ada as a programming language. Thirty percent of the interviewees were lawyers, twenty percent Procuring Contracting Officers (PCOs) or negotiators, and fifty percent Program Managers (PMs). All of the programs were using Ada, thus, confirming that the information obtained during Phase I, Data Availability Determination, was correct.

SPOs are encouraged and often required to use Ada as a programming development language. Using Ada as a software development language allows for the possibility of software reusability. Questions 2b through 2d focused in on how much software was being reused on these Ada programs. Question 2b asked how much previously developed software the contractor proposed to use. Twenty percent said none, ten percent indicated one thousand to ten thousand lines of code, thirty percent responded more than ten thousand lines of code, and forty percent did not know how much reuse the contractor had proposed.

Question 2c considered how much software the Government may have given to the contractor for possible reuse. Thirty percent stated that no software was given to the contractor,

another thirty percent responded that one thousand to ten thousand lines of code had been provided, and forty percent did not know how much, if any, software had been given or offered to the contractor for reuse.

Question 2d concentrated on the funding source for those programs which had reused software. Funding source is important in determining the data rights that are available to each party. Of those that indicated a positive response to either Question 2b or 2c (indicating some reused software), seventy-five percent were Government funded and twenty-five percent were mixed Government and contractor funding.

Reusing software is important in achieving the goals Ada was designed for, but determining where to find and when to reuse software is perhaps not always clear. Therefore, Question 3 asked what procedures were used by the program offices to determine if any software already existed that could be used in the development of software on their project. Ten percent indicated contractor certification was used, thirty percent responded that software was used from a previous Government contract or phase, and sixty percent did not know what procedures, if any, were used to determine if reusable software was available.

Question 4 was aimed at determining whether current DOD policy on software data rights was known to program office personnel and what data rights were currently being used in

Government contracts. Question 4a asked if the interviewees were aware of the latest data rights policy changes. Seventy percent were aware of the changes and thirty percent were not. Question 4b asked what software data rights clause was included in the most recent projects the interviewees had worked on. Sixty percent indicated that unlimited rights were obtained and the other forty percent was evenly distributed between the respones of restricted (contractor funding/non-commercial); restricted (contractor funding/commercial); other; and do not know.

Since so few cases were found in Phase II, Legal Research, involving Government software data rights disputes, Question 5 was intended to determine if any disputes have arisen at the program office level and, if so, how are they being resolved. Question 5a asked interviewees if any disputes had arisen over software data rights on their project. Ninety percent said no disputes had arisen over software data rights and the remaining ten percent did not know if any had arisen or not. Question 5b asked how these disputes were resolved, but since noone indicated that a dispute existed, it became non-applicable.

V. Analysis and Discussion

Chapter Overview

This chapter presents an analysis of each of the research objectives identified in Chapter I. This research effort was initially contemplated in May, 1987. That same month, Part 27 of the Defense Federal Acquisition Regulation Supplement (DFARS) was updated and published in the Federal Acquisition Circular 84-27. The following April 1988, the Federal Register contained another revision. The Defense Acquisition Regulatory (DAR) Council stated in a meeting at Wright-Patterson Air Force Base on May 1988, that further changes were still being contemplated based on research conducted by the Carnegie-Mellon University Software Engineering Institute.

The determination was made that Department of Defense (DOD) policy regarding software data rights was so dynamic and subject to further near term changes that analysis could not adequately be performed on how well that variable policy was implemented. Instead, research efforts were focused on how the courts and the program offices are being affected by the changing policies.

Research Objective 1

> Determine if an adequate data base (e.g., Acquistion Management Information System (AMIS)) exists and is accessible for research.

Data Availability Determination. The first objective does not lend itself to analysis and is not necessary for the purposes of this research. However, a discussion of the findings is necessary to provide the background for research objectives two through four. There were two determinations made with respect to research objective one. First, there were adequate data bases available to locate desired information. A listing of program offices which contracted for Ada as a development language was determined to be kept by the Ada Joint Program Office. Case law on software data rights was determined to be locatable both manually at a local law library and electronically via Federal Legal Information Through Electronics (FLITE) and Westlaw.

Second, while the data bases existed, often the information sought was not found in the data base. This was particularly true for information regarding case law on Government software data rights. This is discussed in more detail under the analysis and discussion of research objective two which follows.

Research Objective 2

Determine what relevant legal cases have been litigated which address the issue of Government software data rights and the impact of these cases on Government rights to data developed by a contractor.

Government Case Law. Only three cases were found even remotely pertaining to software data rights that went to the

Armed Services Board of Contract Appeals (ASBCA), Claims Court, or Comptroller General. This startling result obviously made further research in this area infeasible. Instead, the research focused on the possible reasons why so few cases arose. For example, why is it that DOD policy regarding software data rights is undergoing so much scrutiny and rapid change when virtually no legal cases are being litigated challenging the soundness and validity of the original policy? Could it be because the Government almost always buys unlimited data rights to software and, therefore, contractors have no reason to challenge? Or, is it because Government contract personnel feel it wise to negotiate and settle any disputes that may arise over software data rights rather than face the uncertainty of winning in the courts? Are the regulations too vague to rely upon? Or, perhaps the contractor is getting what he wants and has no reason to challenge the way the Government buys software?

Questions were included in subsequent interviews (under Phase III) in an attempt to make that determination. Results of these interviews are discussed under research objective three below. The conclusions will be discussed in Chapter VI, Conclusions and Recommendations.

The issues raised by three legal cases are summarized below. These issues include: 1) delivery of additional software not initially contracted for; 2) ordering of

software by Government agencies not included in an original distribution list; and 3) 'right to copy' versus 'master license'.

In Software Design, Inc., ASBCA Nos. 23616 & 24897 (September 16, 1982), the contractor listed additional desirable features in its software documentation beyond that required by the Government's Request for Proposal (RFP). When the Government insisted that the additional software features be provided at no additional cost, the contractor objected. The board determined that it was unreasonable for the Government to expect the additional capability without additional compensation. One may conclude from this case, that if the contractor listed something not stated in the contract as being deliverable, then the Government can not have that something without paying more for it.

A case closely related to this issue of only getting what you ask for is Informatics General Corp., ASBCA No. 28692 (February 24, 1984). The Government had provided Informatics with a distribution list of agencies that could order copies of the software. When sub-organizations within those agencies desired to order copies of the software, the contractor insisted on additional compensation since these parties were not on the original distribution list. The contractor prevailed.

The last case is also related to the first two issues of only getting what you contracted for and not necessarily

getting it for everyone who asked for it. <u>Dataware</u> <u>Systems</u>

<u>Lease, Inc</u>., GSBCA No. 8644-P (October 31, 1986), deals with

a 'right to copy' license versus a 'master license'. The

contract was for maintenance for automatic data processing

equipment. The Request for Proposal (RFP) required bidders

to have copies of the original manufacturer's diagnosic

software. The original manufacturer was also a bidder. If

the Government could provide the software to bidders with a

right to copy license, then Dataware could exclude that cost

and prevail as lowest bidder. The board ruled that:

> Although other Navy activities had purchased the
> software for use on those activities' computer
> systems,...this activity had not obtained a master
> license and that the possession of a master license by
> one Navy activity did not entitle another activity to
> purchase a 'right to copy' license [3:19437].

The lesson here is that for a Government agency to

purchase a piece of software does not automatically give all

Government agencies a right to use it. This can be

accomplished, however, by acquiring broader contractual

rights initially.

<u>Commercial</u> <u>Sector</u> <u>Case</u> <u>Law</u>. In researching what

software data rights are being litigated in disputes between

commercial vendors, four (4) issues seem to dominate. These

issues include: 1) idea versus expression; 2) what

constitutes a derivative work; 3) the test for copyright

infringement; and 4) notice of copyright. Each issue is

discussed below in an effort to summarize current judicial

opinion with respect to software data rights between commercial vendors.

Idea Versus Expression. The courts seem to agree that an idea is not copyrightable, but an expression of an idea may be. This is set out fairly clear by the Copyright Act (Title 17 of the United States Code). However, there appears to be diversity of opinion with respect to what consitutes an expression versus an idea. For example, in Apple Computer, Inc. v. Formula International Inc., 725 F.2d 521 (1984), the defendant (Formula) openly admits to copying the plaintiff's (Apple) software. But, Formula goes on to argue that systems programs (e.g., operating systems) were ideas under the Copyright Act, while only applications programs were expressions of ideas. Thus, Formula concludes the ideas (i.e., systems software) can not be copyright protected. The court rejected this argument since Congress had also debated the issue before passing the 1980 Amendment to the Copyright Act and left no distinction:

> A 'computer program' is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result [2:s101].

In contrast, the court in Digital Communications Associates, Inc. v. Softklone Distributing Corp., 659 F.Supp. 449 (N.D.Ga. 1987), ruled that screens generated by a the plaintiff's (Digital) program were not copyrightable,

but the data Main Menu was. The court based its ruling on the following rationale:

> Since the work at issue is the status screen, the court must determine what is the 'idea' behind the status screen and then determine whether the expression of the status screen is 'necessary' to the 'idea' [8:558].

In other words, if there is only one way to express the idea, then the idea and expression merge and there can be no copyright.

Perhaps the most interesting ruling on this issue was in Q-Co Industries, Inc. v. Hoffman, 625 F.Supp. 608 (S.D.N.Y. 1985), which failed to uphold the plaintiff's (Q-Co) copyright infringement claim since the defendant (Hoffman) copied Q-Co's program in another computer language and executed it on different hardware. The Q-Co court attempts to distinguish itself from SAS Institute, Inc. v. S & H Computer Systems, Inc., 605 F.Supp. 816 (M.D. Tenn. 1985), by stating that:

> Moreover, in contrast to the factual finding in SAS Institute, supra, that the defendant had "slavishly copied" plaintiff's work, such copying is impossible here, given the differences between the hardware for the Atari and IBM computers [16:616].

Dispite the Q-Co case, the more rational approach appears to be the one cited in Whelan Associates, Inc. v. Jaslow Dental Laboratory, Inc., 797 F.2d 1222 (3rd Cir. 1986). The plaintiff (Whelan) had developed a program in the computer language, EDL. The defendant (Jaslow) marketed Whelan's product, but developed a similar program in the

37

BASIC programming language. The Whelan court held that
copyright laws extend beyond the literal computer code and
encompass the non-literal elements, such as logic and
structure, as well. The court goes on to say that:

> The copyrights of other literary works can be
> infringed even when there is no substantial similarity
> between the works' literal elements. One can violate
> the copyright of a play or book by copying its plot or
> plot devices [24:1234].

The Whelan court also cites SAS, supra, and follows its
ruling:

> ...the only other case that has addressed this
> issue specifically, in which the court found that a
> program's copyright could extend beyond its literal
> elements to its structure and organization [24:1238].

What Constitutes a Derivative Work. Related to
the analysis of idea versus expression is the issue of
derivative works. One of the most cited cases on the
subject of derivative works does not involve computer
software. Nevertheless, the case is persuasive since
software is treated as a literary work with respect to the
Copyright Act. The case is Saturday Evening Post Company v.
Rumbleseat Press, Inc., 816 F.2d 1191 (7th Cir. 1987), and
involves the Post granting a license to Rumbleseat to
manufacture porcelain dolls based on Norman Rockwell
illustrations. The Post had copyrighted its magazine which
contained the Rockwell illustrations. When the Post
cancelled the license, Rumbleseat refused to stop
manufacturing the dolls claiming it had a copyright in the

derivative works, the dolls. Thus, the main principal involved was one of derivative works. The court ruled in favor of the Post stating that:

> Works derived from copyrighted material--
> 'derivative works' as they are called--are
> copyrightable provided the derivative work has some
> incremental originality; the copyright in the
> derivative work is limited to that increment [20:1193].

However, Rumbleseat probably would have prevailed since the porcelain dolls it manufactured were copyrightable as derivative works. Unfortunately, for Rumbleseat, it had agreed in its contract with the Post to assign to the Post any copyright it received in its own name.

SAS, supra, also addressed the issue of derivative works. The defendant (S & H) challenged the validity of the latest release of the computer program, 'SAS', claiming it was not a new and original work since allegedly only minor changes were made to the new release. However, the court found changes to be substantial and the derivative work copyrightable.

The Test for Copyright Infringement. While the first two issues are perhaps subject to more disagreement, there appears to be a concensus among the courts for determining whether a copyright has been infringed. The test consists of two prongs: 1) is there proof that the individual claiming infringement owns the copyright; and 2) was the copyrighted work copied. Whelan, supra, was the most cited authority for the bifurcated test. The first

39

part of the test is usually satisfied by producing the copyright certificate. But, as Whelan points out, direct copying is often difficult to prove. Therefore, the court allows submission of circumstantial evidence to create a preponderance of copying. This is accomplished by showing the infringer had access to the work and that there was substantial similarity between the two works. Some courts also break the substantial similarity test in to two pieces. First, expert testimony is used to aid the fact-finder in determining whether sufficient similarity exists between the two works to conclude that one was used to write the other. If 'yes' to the first question, then the fact-finder must determine as a 'lay-observer' whether the copying was 'an unlawful appropriation'. Nevertheless, the Whelan court accepted the increasingly popular singular test of substantial similarity which allows both expert and ordinary observer testimony.

In Lasercomb America, Inc. v. Holiday Steel Rule Die Corp., 656 F.Supp. 612 (M.D.N.C. 1987), the alleged infringer, Holiday, attempted to argue that its computer program was not substantially similar to Lasercomb's since substantial effort went into producing the Holiday program. The court was not persuaded by the argument and cited Whelan, supra, "...the fact that it took a great deal of effort to copy a copyrighted work does not mean that the copier is not a copyright infringer" (11:616).

Notice of Copyright. Finally, it is worth noting
that Lasercomb, supra, points out the apparent requirement
that notice must also be given of a copyright interest in
order to protect that interest. The defendant (Holiday
Steel Rule Die Corp.) claimed it did not know Lasercomb
claimed a copyright interest in its computer program.
Lasercomb had placed the copyright notice on its
documentation and not on the software itself. This was
determined to be sufficient notice since Holiday received
the documentation with the software.

Research Objective 3

> Determine what procedures, if any, are used by
> lawyers, Procuring Contracting Officers (PCOs),
> and/or Program Managers (PMs) to ensure software
> contracted for was not previously developed under
> a prior Government contract (e.g., certification
> from contractor; data base search).

The first issue to be analyzed is the amount of
software that is being reused in SPOs using Ada as a
development language. While not all interviewees at every
level were aware of it, almost every program office reported
some reuse of software. The amount of software proposed for
reuse by both the Government and contractors seemed fairly
even. It is interesting to note, however, that the only
time software was proposed for reuse was when it was from a
prior development phase or closely related Government
contractual effort. Apparently, no other procedures (e.g.,
data base search) were used to determine if other software

41

existed that could potentially be reused to satisfy program requirements. Furthermore, in only one case did the contractor certify a restricted interest in a piece of software and this was to a compiler. Of the one program office that did not report any software reuse, it was stated that the project was too new and state-of-the-art for any software to have been previously developed that would satisfy its requirements.

A natural follow-up question to the amount of software being reused involves the data rights the Government is getting to the software it pays to have developed. Most of the software proposed for reuse was originally developed at Government expense. Thus, it is not surprising that an almost equal number of cases reported the Government requiring unlimited rights to the derivative software. However, the revised software data rights regulations and policy seem to encourage the Government to obtain the minimum amount of rights required to fulfill its mission. While most interviewees were aware of the latest updates to the regulations, perhaps the intent of the updates is not as clear. Additionally, not much time has elapsed since these updates were published and most likely the contracts relevant to this study were already awarded.

The final point, and perhaps most interesting, coming out of the interviews deals with any disputes that may have arisen at the SPO level between the Government and a

contractor over software data rights. Since the legal research revealed so few cases on the subject, it was suspected that any disputes were being resolved by negotiations. However, none of the interviewees were willing to label any contractor disagreements over software data rights as 'disputes'. Nevertheless, there were some 'disagreements'. In every instance, these disagreements were resolved with discussions between the contractor and the Government.

It is encouraging that the Government and its contractors appear to be able to resolve their respective data rights. But, it still leaves unanswered the question of what drives the recent changes to the DOD software data rights policy since there are virtually no formal disputes, not to mention litigation, over the issue.

Research Objective 4

> Determine what mechanisms should be added or modified to better ensure appropriate software data rights clauses are used and controlled in Government contracts.

This objective will be accomplished in Chapter VI, Conclusions and Recommendations.

VI. Conclusions and Recommendations

Chapter Overview

This chapter summarizes the conclusions that can be drawn from this study on DOD software data rights policy and makes recommendations based on those conclusions.

Conclusions

1. DOD software data rights policy continues to change. The changes are not motivated by formal disputes between the Government and its contractors. The changes are primarily externally generated and mandated by Congress.

2. There are very few Government legal cases being litigated over software data rights. Almost all disagreements between the Government and its contractors over this issue appear to be resolved at the System Program Office (SPO) level. The lawyers and courts are rarely being involved. It is not clear, however, if this cooperation is resulting in a win-win situation for both sides.

3. Commercial vendors, on the other hand, are litigating over various software data rights issues. Their rights are clearly defined in the Copyright Act which provides stability to the industry. Commercial vendors are more motivated to zealously control misuse of their products. The courts also seem to be fairly consistent in their rulings in commercial cases.

4. SPOs are willing to reuse software on their projects if they know it exists from a prior development phase or closely related Government effort. If procedures exist to locate other software for potential reuse, it apparently is not known to the SPOs. Most of the software that is being reused was originally Government funded.

5. Unlimited data rights clauses are still being used in most Government software development efforts. It is still too early to determine if the intent of the May 1987 and April 1988 changes to the Defense Federal Acquisition Regulations Supplement (DFARS) to relax this requirement will be carried out in near-term software development efforts.

Recommendations

1. There appears to be a dilemma between stablizing Government regulations regarding software data rights and making further changes to clarify vague issues that may still exist. A consistent, stable policy, as seen in commercial case law, enables the parties to act with confidence on their respective rights. It is recommended that a well conceived update to the DFARS be published, commented on by industry and Government personnel at all levels, and allowed to stablize and form a true policy.

2. Test cases should be filed on possible Government copyright infringers. Firm case law from the Armed Services

Board of Contract Appeals (ASBCA) or the U.S. Claims Court would provide a better understanding to both Government and contractors of their respective rights and negotiating strengths.

3. A central data base should be created for software that is available for reuse by SPOs. If such a data base exists, it must be made known to SPO personnel and its use promoted.

4. SPO personnel should be required to implement some procedure(s) for locating and providing potentially reusable software. At the very least, contractors should be required to: 1) certify the amount of software they intend to reuse; 2) identify the data rights they claim to that software; and 3) identify the basis upon which those claims are made (e.g., contractor funded).

5. SPO personnel should be educated on the intent of current DOD software data rights policy and how best to implement that policy in its contracts.

Appendix A: Interview Questionnaire

1. Over the past few years DOD has invested in new software
technology, namely Ada, to reduce escalating software life
cycle costs. This study is directed toward Air Force SPO
personnel that have dealt with recent software issues. In
what capacity have you dealt with software data rights
within those four years?

    a. PCO/Negotiator
    b. Project/Software Manager
    c. Attorney
    d. None
    Comments:

2. SPOs are encouraged and often required to use Ada as a
programming development language. Using Ada as a software
development language allows for the possiblity of software
reusability.

    a. What was the computer language used on your most
    recent project?

        (1). Ada
        (2). Other
        (3). Do not know
        Comments:

    b. How much previously developed software did the
    contractor propose to use?

        (1). None
        (2). <1000 lines of code
        (3). 1000 - 10000 lines of code
        (4). >10000 lines of code
        (5). Do not know
        Comments:

c. How much previously developed software did the Government require the contractor to use or make available through Government Furnished Property?

    (1). None
    (2). <1000 lines of code
    (3). 1000 - 10000 lines of code
    (4). >10000 lines of code
    (5). Do not know
    Comments:

d. If some software reuse was proposed by the Government or contractor, who paid for the original development of the reused software?

    (1). Government
    (2). Contractor
    (3). Subcontractor
    (4). Government/Contractor mixed funding
    (5). Do not know
    Comments:

3. Reusing software is important in achieving the goals Ada was designed for, but determining where to find and when to reuse software is perhaps not always clear. What procedures were used to determine if any software already existed that could be used in the development of software for your project?

    a. Contractor certification
    b. Data base search
    c. Prior contract
    d. Other
    e. None
    f. Do not know
    Comments:

4. DOD software data rights policy has undergone several changes within the last year and still more may be contemplated. It is important to determine if these changes are filtering down to the action officer level.

a. Are you aware of the latest changes to DOD software data rights policy which allow for either unlimited rights or one of two types of restricted rights depending on source of funding and extent of commercialization?

    (1). Yes
    (2). No

b. What type of software data rights clause was included in your most recent project(s) requiring software development?

    (1). Unlimited
    (2). Restricted (Contractor funding/ Non-Commercial)
    (3). Restricted (Contractor funding/Commercial)
    (4). Other
    (5). Do not know
    Comments:

5. There appear to be few court cases involving the Government and contractor disputes over software data rights.

a. Have any disputes arisen over software data rights on your project(s)?

    (1). Yes
    (2). No
    (3). Do not know
    Comments:

b. If there were disputes over software data rights, how were they resolved?

    (1). Negotiation
    (2). PCO determination
    (3). Litigation
    (4). Other
    (5). Do not know
    Comments:

Appendix B: Glossary

1. Commercial Computer Software. Computer software which is used regularly for other than Government purposes and is sold, licensed, or leased in significant quantities to the general public at established market or catalog prices [7:10781].

2. Compilation. A work formed by the collection and assembling of preexisting materials or of data that are selected, coordinated, or arranged in such a way that the resulting work as a whole constitutes an original work of authorship [2:s101].

3. Derivative Works. Work based upon one or more preexisting works, such as a translation, musical arrangement, dramatization, fictionalization, motion picture version, sound recording, art reproduction, abridgment, condensation, or any other form in which a work may be recast, transformed, or adapted. A work consisting of editorial revisions, annotations, elaborations, or other modifications which, as a whole, represent an original work of authorship, is a 'derivative work' [2:s101].

4. Developed Exclusively with Government Funds. In connection with an item, component, or process, that the cost of development was directly paid for in whole by the Government or that the development was required as an element of performance under a Government contract or subcontract [7:10781].

5. Developed Exclusively at Private Expense. In connection with an item, component, or process, that no part of the cost of development was paid for by the Government and that the development was not required as an element of performance under a Government contract or subcontract [7:10781].

6. Government Purpose License Rights (GPLR). Rights to use, duplicate, or disclose data (and in the SBIR Program, computer software), in whole or in part and in any manner, for Government purposes only, and to have or permit others to do so for Government purposes only. Government purposes include competitive procurement, but do not include the right to have or permit others to use technical data (and in the SBIR Program, computer software) for commercial purposes [7:10782].

7. **Limited Rights**. Rights to use, duplicate, or disclose technical data, in whole or in part, by or for the Government, with the express limitation that such technical data shall not, without the written permission of the party asserting limited rights, be: Released or disclosed outside the Government; used by Government for manufacture, or in the case of computer software documentation, for preparing the same or similar computer software; or used by a party other than the Government, except when:

(a) Release, disclosure, or use is necessary for emergency repair or overhaul; provided that the release, disclosure, or use outside the Government shall be made subject to a prohibition against further use, release, or disclosure, and that the party asserting limited rights be notified by the contracting officer of such release, disclosure, or use; or

(b) Release or disclosure to a foreign government that is in the interest of the United States and is required for evaluational or informational purpose under the conditions of (a) above, except that the release or disclosure may not include detailed manufacturing or process data [7:10782].

8. Restricted Rights. Rights that apply only to computer software, and include, as a minimum, the right to--

(a) Use computer software with the computer for which or with which it was acquired, including use at any Government installation to which the computer may be transferred by the Government;

(b) Use computer software with a backup computer if the computer for which or with which it was acquired is inoperative;

(c) Copy computer programs for safekeeping (archives) or backup purposes; and

(d) Modify computer software, or combine it with other software, subject to the provision that those portions of the derivative software incorporating restricted rights software are subject to the same restricted rights [7:10782].

9. Software (or computer program). A set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result [2:s101].

10. Unlimited Rights. Rights to use, duplicate, release, or disclose, technical data or computer software in whole or in part, in any manner and for any purpose whatsoever, and to have or permit others to do so [7:10782].

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Thesis Chairman: Dr. Melvin Wiviott
Professor of Government Contract Law

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The purpose of this study was to examine the adequacy of Air Force acquisition policies and procedures for software with particular emphasis on derivative works as it applies to reusable software. The study had two primary objectives: 1) Determine what relevant legal cases have been litigated which address the issue of Government software data rights and the impact of these cases on Government rights to data developed by a contractor: and 2) Determine what procedures, if any, are used by System Program Office (SPO) personnel to ensure software contracted for was not previously developed under a prior Government contract.

The methods for accomplishing the objectives included manual and automated legal research techniques as well as interviews with SPO personnel.

The study found that while commercial vendors were frequently litigating over software copyright infringement, very few disputes existed in the legal system between the Government and contractors over the issue of software data rights. This finding was interesting in light of the frequent updates that have been made to the DOD software data rights policy over the last two years.

Analysis of interviews conducted with SPO personnel found that almost all disagreements between the Government and contractor personnel over software data rights have been resolved through discussions between the two parties.

While some software is being proposed for reuse on current projects, most of the software that is being reused comes from a prior development phase or closely related contractual effort. Apparently, no additional procedures are being employed to locate reusable software. The software that is being developed is still being primarily acquired with unlimited rights.